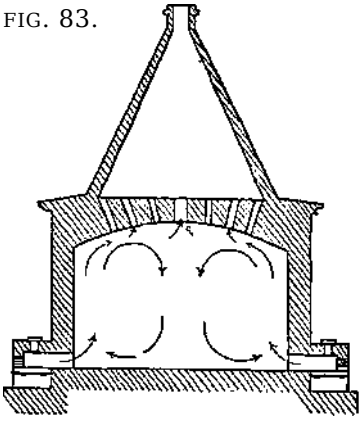
In a preceding chapter the principles governing the computation for the updraft chamber furnace -have been stated. By partially closing the smoke hole in the dome it is possible to force the free lower surface of the hot gases in the kiln chamber down to the hearth level, and thus force the heating of ware placed upon the hearth. Nevertheless such a method of heating is very imperfect and is not uniform. Its mechanics are as follows:

FIG. 83.



The incandescent and burning gases issuing from the firebox (Fig. 83) rise immediately to the highest point in the chamber; therefore the central portion of the heating chamber does not receive any direct action from these ascending currents, and is accordingly filled by heavier and colder gases than those coming from the fireboxes. These heavy gases gradually drop to the hearth of the chamber as the upper parts of the chamber fill with the hotter gases. Portions of these colder gases in the bottom of the chamber become mixed with the heated gases flowing from the fireboxes and rise with them. Finally a circulation of gases is established within the chamber, so that all portions of the charge are gradually heated.

Moreover, only a small portion of the heated gases circulate in this manner. The largest portion of the hottest gases escape immediately to the chimney through the smoke holes in the roof of the kiln. For these reasons, all the ware, which is set where it comes into direct contact with the hot gases is hard burned, whereas the burn of the ware which only comes in contact with the colder currents of gases will be less hard and

portions of the ware will receive a very slight burn.

While updraft or direct-draft kilns continue to be used in many of the clay products plants, the principles of the downdraft kiln

Note by English translator.—Considerable heat is carried down to the hearth of the kiln by conduction through the charge and the walls.